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ABSTRACT

A study was conducted to assess the feasibility of establishing a regional information transfer center within the context of the National Network of Transportation Research Information Services (TRISNET). The principle areas of investigation were: (1) the transportation information needs of the public and private sectors; (2) the utility of federal publications, including work in progress reporting and abstracting/indexing services; (3) the use of referrals to university faculty; (4) the use of the research library; and (5) the overall impact of regional center operations. The report concluded that, in order to capitalize on existing transformation information sources, centers should be located in areas of diversified transportation activity. Also recommended were regional funding for centers, regional charges and marketing, and specialized products for TRISNET. (EMH)

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Report No. DOT-OST-76-36

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The Effectiveness and Feasibility of a TRISNET Regional Center in Information Transfer

ED124114

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Final Report

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EXECUTIVE SUMMARY

The primary objective of this project was an assessment of the effectiveness and feasibility of a regional center in information transfer within the context of the National Network of Transportation Research Information Services (TRISNET). Principal areas investigated were the identification of transportation information needs in state and local government and in the commercial transport sector; the utility of federal publications, work in progress reporting and the TRIS abstracting/indexing services; use of referrals to university faculty and the Technology Sharing Program of the Department of Transportation Transportation Systems Center; use of the regional center services offered through a transportation research library; and the impact of regional center operations supplied through an existing resource on in-house commitments and funding requirements.

A Regional Transportation Research Information Service for the Chicago metropolitan area (R-TRIS Chicago) was established to implement this project. It offered the services of the existing resources of the Northwestern University Transportation Center faculty and library, access to TRIS-On-Line and a referral capability to 84 users from 18 transportation organizations in exchange for user-supplied data on information needs and behavior and service evaluation.

R-TRIS transactions (computer searches, bibliographies, literature compilations, loans, photocopies and referrals) with users totaled 831. Approximately half of the 84 designated users accessed the services; requests were processed for 59 other members of the organizations resulting in part from designated user referrals, internal advertising and circulation of the current awareness bulletins.

The majority of users were satisfied with the service as indicated by post-service analysis of attitudes, evaluation and willingness-to-pay. Access to documents and literature searches at the beginning of new projects were the primary reasons for R-TRIS contacts. Utilization of a regional center was estimated at one request per user per month.

The users presented a range of needs requiring a match in services covering the full range of transportation activity. Federal publications and research in progress, the primary information sources, were criticized by some for limited scope, non-transferability and diffused announcement. Currency and expansion in subject coverage of the TRIS-On-Line data base is essential to meet the planned level of this service as the preeminent documentation service in transportation information. The few requests referred to faculty and the Technology Sharing Program were very successful, but the majority of users did not regard these services as part of their routine information seeking patterns.

The R-TRIS experience substantiates user acceptance of regional centers. The proposed National Network of Transportation Research Information Services organizes a complex set of information elements. Regional access to the system is beneficial (1) to provide the documents referenced in the data bases, (2) to guide or refer the user to the most effective resource within the information service conglomerate, and (3) to supplement and refine the marketing program conducted by system management.

The projected role for regional centers includes circulation or photocopy of

transportation documents, direct to users or through interlibrary loan; onsite use; brief reference assistance; referral to appropriate resources; conducting TRIS-On-Line searches for users without terminals; and reporting user needs to TRISNET management. The provision of technical reference services in bibliographic and literature compilation based on the collection of the existing resource would be optional with the center.

These functions can be effected through support covering document delivery, referral and user feedback, with user charges reimbursing TRIS-On-Line, photocopy and technical reference service costs.

The acceptance and limitations of the experimental project lead to further recommendations for TRISNET and regional center operations:

1) expand the regional concept to include additional general transportation information resources in areas of high transportation activity, with communications and records linkage to provide full document delivery service to the information user

2) extend the service to a multistate region

3) institute user charges to cover selected services: photocopies, TRIS-On-Line and specialized library services (the latter optional with the center)

4) distribute a DOT Status Report to consolidate and highlight announcement of DOT activity, programs and research

5) provide a DOT document depository to each regional center

6) expand the TRIS-On-Line data base to cover important publications for the full range of transportation activity; insure currency

7) introduce a TRIS-On-Line legislative announcement service

8) establish a training program in TRIS-On-Line for regional center staff conducted by the compilers of the TRISNET abstracting/indexing services

9) expand the DOT technology sharing orientation programs

10) investigate the role of the knowledgeable person in transportation information transfer

11) establish a professional marketing program for national and regional outreach

12) institute document delivery center identification in the abstracting/indexing services citations to selected journals and serials, available to the user on computer and publications searches

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I. INTRODUCTION

In designing a broad-based information service for the U.S. transportation community the DOT-sponsored Committee on Transportation Research Information Systems has proposed a National Network of Transportation Research Information Services (TRISNET). The network would offer the transportation information seeker one-stop service, defined as a single point of inquiry and response which accesses the entire system, based on the linkage of existing abstracting/indexing services and regional information centers with document delivery capability and facilitated by system directories and a communications-coordination center.

The network is currently developing under the auspices of the U.S. Department of Transportation Office of the Assistant Secretary for Systems Development and Technology. The overall design for this program is presented in Figure I.1, reprinted from the July 1975 report of the Committee on Transportation Research Information Systems.

The regional center component of the network has not been tested. In some respects the concept is innovative: an assigned and publicized responsibility for an existing resource in transportation information, public or private, to provide local service directly to the user. Through the network the user may draw upon the transportation collections and the data bases of several existing resources for loans or photocopies, with the necessary interaction initiated by the regional center receiving the request.

The work of the Northwestern University Transportation Center under contract DOT-OS-40090 concerned the role of a regional center within the context of TRISNET development. The primary objective of this project was an assessment of the effectiveness and feasibility of a regional center in information transfer. The identification of user requirements with implications for the national system formed a related objective.

The following specific areas were investigated to meet these objectives:

1) transportation research information needs in state and local government and in the commercial transport sector

2) use and evaluation of federal publications and work in progress

3) use and evaluation of the abstracting/indexing services, specifically the TRIS-On-Line data base accessed by remote terminals

4) acceptance of referral services to Northwestern University faculty and the Technology Sharing Program of the Department of Transportation Transportation Systems Center

5) regional center capability built on an existing document resource

6) regional center feasibility within institutional constraints and funding requirements

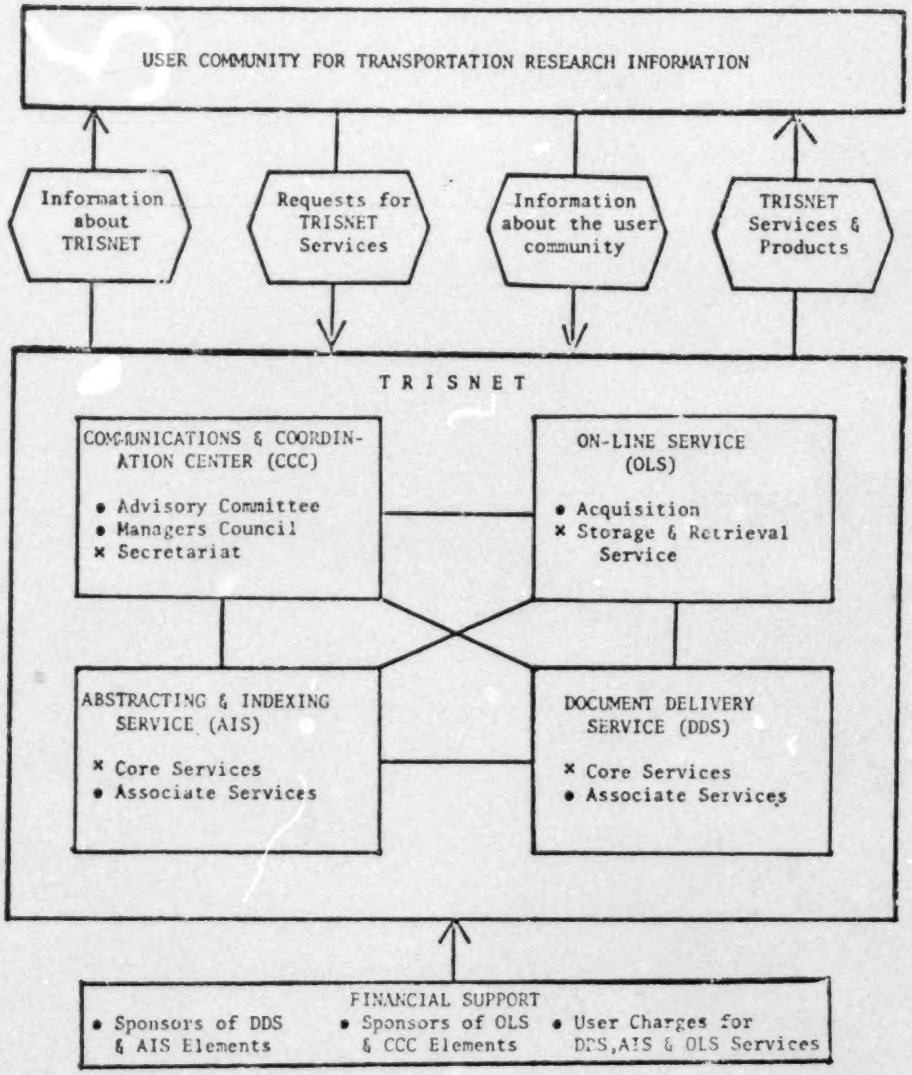
USER COMMUNITY FOR TRANSPORTATION RESEARCH INFORMATION
Information about TRISNET
Requests for TRISNET Services
Information about the user community
TRISNET Services & Products
T R I S N E T
COMMUNICATIONS & COORDINATION CENTER (CCC)
• Advisory Committee
• Managers Council
× Secretariat
ON-LINE SERVICE (OLS)
• Acquisition
× Storage & Retrieval Service
ABSTRACTING & INDEXING SERVICE (AIS)
× Core Services
• Associate Services
DOCUMENT DELIVERY SERVICE (DDS)
× Core Services
• Associate Services
FINANCIAL SUPPORT
• Sponsors of DDS & AIS Elements
• Sponsors of OLS & CCC Elements
• User Charges for DDS, AIS & OLS Services
× Primary entry points for user requests

Figure I.1. Overall Design for TRISNET[1]

[1]National Research Council Transportation Research Board, Design Concepts for a National Network of Transportation Research Information Services (TRISNET), a report of the Committee on Transportation Research Information Systems, July 1975 (distributed by NTIS).

To carry out the contract objectives a prototype regional transportation research information service for the Chicago metropolitan area (R-TRIS Chicago) was established by the contractor, using existing transportation faculty and library resources at Northwestern, to offer a set of information services to selected transportation organizations. An analysis of user needs and behavior in information acquisition and service demands was conducted to assess the impacts of a TRISNET regional center on the user and on the existing resource.

The limitations of the investigation must be noted as important cautionary considerations for TRISNET management. R-TRIS Chicago provided service to users at virtually no charge. Although a marketing program was not included in the project, an extensive orientation session was conducted for each user group at its base and/or R-TRIS Chicago. The free services and orientation sessions were designed into the experiment in that the services were introductory.

R-TRIS Chicago operated as a node without links, a situation quite different from the addition of a regional center to a well-publicized existing network.

R-TRIS Chicago served Chicago metropolitan area users rather than the users of a multistate region to be served under network operations.

The TRIS-On-Line data bases were not up-to-date during the period of the project.

The investigation was premised on the decentralized network recommended by the TRIS Committee based on their considerations of accessibility, cost and the knowledge of user needs for transfer to the national system. Comparisons with a centralized design were not within the scope of the project.

The operation and implications of R-TRIS Chicago, within the framework of user needs, interaction and evaluation, are described in this report. The project organization, user population and user/service interaction are outlined in Section II with the analysis of user needs and service feasibility and effectiveness following in Section III. The final section contains the conclusions and recommendations on regional center development.[1]

[1]A preliminary report presenting a detailed analysis of the methodology and data collected for this project is available from the Transportation Center.

II. PROJECT DESCRIPTION

This project was implemented through the offer of a set of information services by a regional center (R-TRIS Chicago) to a group of designated transportation professionals in the Chicago metropolitan area. A description of the services, user population and regional center organization and preliminary data on user/service interaction are presented in this section.

R-TRIS Services

The set of services offered to R-TRIS Chicago users comprised the services offered through TRISNET, the Technology Sharing Program of the U.S. Department of Transportation Transportation Systems Center (TSC) and the transportation resources at Northwestern University.

The TRISNET services included searches of the TRIS-On-Line files referencing DOT work in progress, the highway, railroad and maritime research information services and specialized topical and statistical compilations. The TSC Technology Sharing Program offered referral to specific resources and experts as well as literature compilation.

Northwestern transportation resources involved the Faculty Associates and Library of the Transportation Center. Faculty Associates number 35-40; their interests range from railroad engineering to air transportation data needs to public participation in urban transportation to mathematical modeling and operations research applications. The Library holds one of the major general transportation collections in the United States, specializing in operations, management, planning, regulation, impact and safety for all modes at the urban, intercity and international levels.

The specific services were:

TRIS-On-Line searches, including user terminal instruction if desired

referral to the TSC Technology Sharing Program

Northwestern University faculty onsite or telephone consultation for referral to applicable published reports, research in progress or subject experts

technical reference assistance comprising bibliographic or literature compilation from library holdings

circulation of publications from the Transportation Center Library collection or other Northwestern University Library collections

distribution of three current awareness services: Current Literature in Traffic and Transportation (index of books, reports, articles and papers acquired by the Transportation Center Library, monthly, 725 entries per issue); DOT Publications Aware-

ness Bulletin (photocopies of technical report documentation pages from DOT research reports distributed through the National Technical Information Service, six issues, 25-30 entries per issue); TRANS-SCAN (photocopies of contents pages of selected transportation journals and proceedings, semi-monthly, 30-35 entries per issue)

Each of these services was offered to the users at no charge (excepting photocopies of library materials ordered by the user) for a period of six months or longer.

User Population

Eighteen organizations in the Chicago metropolitan area participated in the project. These were selected from transportation organizations known to R-TRIS staff to represent the various affiliations of transportation information users. Participants included five carriers, five consultants, eight state and local government agencies, one association technical facility and one university (with two organizations assigned to two categories). Twelve participants were principally in urban transportation, six in intercity. Seven of the organizations had established libraries.

Individual users were selected by organization management to represent various transportation functions. The total group, 84 users, constituted a well-educated sample of administrators, technical personnel and librarians with reasonable experience in the transportation field.

Their characteristics are summarized from 66 returns on questionnaires distributed at the beginning of the project.

- Key transportation function (66 responses)

  Planning and R&D were the major functions within the total user group, identified with 40 (60.6%) of the respondents. Twelve (18.2%) were self-categorized as administrative, eight (12.1%) were involved in engineering/operations. Librarians and faculty included six users, 9.1% of the total.

- Modal affiliation (64 responses, excluding faculty)

  User modal affiliations were primarily with urban transportation (44 or 68.8%) including roads and traffic planning as well as general urban transportation operations and research. Nineteen of this group were concerned solely with urban mass transportation. Intercity representation (20 users) included participation by air transportation (5 users, 7.8%) and rail transportation (8 users, 12.5%). Seven users, or 10.9%, were assigned to a general intercity transportation function.

- Transportation activity as a percent of total activity (60 responses, excluding librarians and faculty)

Forty-eight (80.0%) of the respondents considered over three-quarters of their activity related to transportation. Administrative and staff operations in transportation organizations accounted for part of the non-transportation functions; activity in four of the organizations included transportation as a major segment of the total program.

- Information activity as a percent of total activity (62 responses, excluding librarians)

  One seventh of the users estimated 25% or more of total time on information-seeking activity. Forty-five (72.6%) indicated information activity of less than fifteen percent.

- Education (66 responses)

  Thirty-six (54.5%) of the users had earned an advanced degree of whom five outside Northwestern University held doctorates. Over half of the group completed their degrees more than five years ago; 16% received the degree within the past two years.

- Professional experience (66 responses)

  Average length of professional experience in transportation was 7.2 years. Half had worked less than five years; 9 (13.6%) less than two. Slightly over one-quarter had been in a transportation field for ten or more years.

- Transportation Center Library contact prior to R-TRIS (60 responses, excluding faculty and librarians)

  Twenty-seven users had no previous contact with the Transportation Center Library. One third had contacted the Library within the past year.

Data were also acquired on specific information sources (published and online) and types of publications and services for accessing the sources.

Although the designated users provided the data analyzed for this project, services were not limited to these individuals. Any employee of a user organization was eligible for R-TRIS services. Under service policy, if a person used the services more than once he would be asked to become a designated user and complete the project data instruments. Several non-designated users did reappear. However, since the project was then in its late stages these users were not asked to complete the forms.

Regional Center Organization

The services were conducted by an R-TRIS Coordinating Unit, formed by the Transportation Center Library reference staff, who received all user requests, made referrals where appropriate, and responded on library and TRIS-On-Line

searches. An R-TRIS Advisory Committee was selected from the user population to evaluate reports on the user/service interface and recommend service improvements and new user contacts.

The services were presented to each user group in two-hour orientation sessions. The orientation included the distribution of a packet of introductory materials on the project and a demonstration of TRIS-On-Line. At these sessions a liaison was assigned as the principal contact for announcement of new services or reports on use within each organization.

Although all services except photocopies were free, a fee schedule was established for each of the services based on existing service charges at the Transportation Center Library and TRIS-On-Line rates to the user. Where rates had not been established, estimated labor and materials costs determined the level of charges. The expenditures under the fee schedule against a hypothetical budget allocation were reported to the liaisons on a bi-monthly basis.

Data were gathered from the users through pretest and posttest questionnaires, diary cards, Coordinating Unit records and post-service interviews.

The pretest consisted of a set of three instruments. The major form was designed to gather data concerning user characteristics, current information seeking behavior and satisfaction with present sources. The other two instruments asked questions about previous use and satisfaction with the Transportation Center Library and awareness and reading frequency of selected transportation journals.

Diary cards provided a step-by-step analysis of actual searches performed by the users. Each user was requested to complete fifty cards, one for each information search performed. This record included but was not limited to searches made through R-TRIS Chicago.

The posttest questionnaire repeated some of the pretest questions to determine changes in user characteristics and asked for new data based on user experience with the simulated regional center during the service period. Portions differing from the pretest included scales to measure service awareness and attitudes toward R-TRIS services, questions about federal publications, unmet needs, projected behavior under a fee-for-service system, and items to collect data about irregularities or changes in information needs which occured during the experimental service period.

Further evaluation of R-TRIS services and suggestions for future TRISNET development were gathered from eleven of the most frequent users in post-service interviews.

Additional data were compiled by the Coordinating Unit for each interaction with users. This information included the characteristics of the user's request and the Library's response.

In addition to the referrals to the Technology Sharing Program at the Transportation Systems Center a link was established with the Technical Information Center of that organization. Recognizing the complementarity of two document collections, the Technical Information Center in transportation engi-

neering and the Transportation Center Library in transportation socio-economics, the following attempts at service coordination were established: (1) the Transportation Center Library was to provide photocopies of catalog cards preliminary to literature searches undertaken by the Technical Information Center at their request; (2) requests for publications by either library could be made by telephone, bypassing the standard interlibrary loan procedure, (3) the Transportation Center Library was to send the Technical Information Center forms recording indexing of transportation journals and conference papers.

User/Service Interaction

Through June 30, 1975 a total of 474 requests, generating 831 transactions, were processed at R-TRIS Chicago. In these totals requests for service (474) were defined as user contacts for any of several R-TRIS products (computer searches, bibliographies, library materials, literature compilation, faculty referrals). The transaction count consists of total items (printouts, bibliographies, loans, photocopies, facts) forwarded to the user. Essentially the difference is that one request for library materials may generate a number of circulations or photocopies. Transaction by request product follows:

Table II.1. Transaction Categories

Transaction	Number	Percent
Citation	589	70.9
Library reference	166	20.0
TRIS-On-Line	71	8.5
Faculty referral	3	0.4
TSC referral	2	0.2

Of 84 designated users from the 18 organizations 43 (51%) used the services beyond the current awareness tools sent to all on a routine basis. A total of 102 users from the member organizations contacted R-TRIS Chicago, in part due to referral or advertising of the services within the organization. In organizations with the librarian a designated user, total users were higher by an unknown quantity in that the librarian requesting the service was usually considered the ultimate user for data compilation.

Subject areas for service requests were cross-tabulated by mode and aspect. The total, 389, excludes some user self-help, directory requests where no aspect was identified and requests for loans or photocopies where the records do not specify the subject area. Requests on transit operations represented 44.5% of total requests, followed by rail and highway-motor vehicle at 17.0 and 11.8% respectively. In subject aspect 148 of 389 requests (38.0%) concerned planning and 84 (21.6%) operations. Physical distribution requests totaled 11.

On subject requests the librarians usually discussed the range of services offered to obtain the user's preference. The selection among TRIS-On-Line, library manual search and faculty referral often resulted in a combined search of the online file and the library collection.

Service responses per organization averaged 46.1; organization/weeks in the project totaled 587. Average response per week came to 19.3, or 1.1 per organization per week.

Seventy-eight percent of the requests were processed by R-TRIS Chicago in one-half hour or less; 9.4% required over one hour to complete, including ten requests with required response time of three hours or more.

Access and response modes were also analyzed. In the following table, "Follow-up" indicates action initiated by a librarian on an earlier request.

Table II.2. Access and Response Modes

Mode	In	Out
Telephone	359	133
Mail	5	193
Onsite	107	148
Follow-up	3	-

First class mail was frequently offered to users in that book rate delivery in the Chicago area could not be promised within two weeks. Most of the users contacted desired first class mail, indicating an urgent need for the response. This contrasts with the usual practice of the Transportation Center Library for external mailing at book rate unless the user pays the postage. Book rate has been acceptable to most users.

Response time was one week or less for eighty-two percent of the requests.

Table II.3. Response Time

Interim	Requests	Percent	Cumulated Percent
1 day	259	54.7	54.7
2 days	40	8.4	63.1
≤1 week	93	19.6	82.7
≤2 weeks	39	8.2	90.9
≤1 month	23	4.9	95.8
>1 month	20	4.2	100.0

The data are based on in-house time (receipt of request to transmittal of response) and include self-service.

The delays beyond one week were due to several factors. In circulation, materials were in processing or on loan to other users and had to be recalled. Several delays in user pickup or receipt of the computer printouts are reported although these factors were excluded from the statistical analysis where identified. The last factor concerned projects (checklists of basic sources in specific areas, assisting in establishing departmental book collections and subject heading development), access to other library resources in and outside Northwestern and several large-scale bibliographies prepared on user requests.

III. DATA ANALYSIS

In section I of this report six specific areas of investigation to determine user needs and regional center effectiveness and feasibility were identified:

1) transportation research information needs in state and local government and in the commercial transport sector

2) use and evaluation of federal publications and work in progress

3) use and evaluation of the abstracting/indexing services, specifically the TRIS-On-Line data base by remote access

4) acceptance of referral services to Northwestern University faculty and the DOT-TSC Transportation Sharing Program

5) regional center capability built on an existing document resource

6) regional center feasibility within institutional constraints and funding requirements

The R-TRIS experience as it relates to each of these areas follows.

Transportation Research Information Needs

The analysis of information needs relies on (1) user response to pre- and posttest questionnaires on information channels accessed and the importance of various information sources and publication types and (2) the records of user/service interaction. This analysis reveals a lack of homogeneity in information seeking behavior and the requirements for a mix of services necessary to meet the needs of operations and research.

Diversity within the user group reflects a range of transportation activity (modal and intermodal, urban and intercity, domestic and foreign), a range of transportation functions (carriage, shipments, facilities, equipment supply), and a range of transportation responsibilities (operations, planning and research, regulation, education). In practice, the transportation community is comprised of several specialized user communities, in part indicated by the fact that no one association serves all transportation professional activities, functions and responsibilities.

The various interests in transportation are only suggested in the R-TRIS user group. The organizations included air, rail and transit carriers; shippers; equipment suppliers; urban transportation planning agencies; management and urban consultants. Within the organizations functional specializations included management, operations, planning, R&D, engineering and education.

Information requests of R-TRIS Chicago evidence the diversity within the user group. All transportation modes except pipelines were represented in the

subject searches, from the carriers and shipper's viewpoints. The concentration on operations and planning emphasizes the need for highly current materials. At the next level of interest, statistics, engineering and impact were the subject of requests for backup information for operations and planning. Three of the post-service interviews stressed statistics; quantitative data were essential, published sources were helpful but insufficient. Two of these organizations generate their local statistics and identified their needs for national and other metropolitan area projections to be used in trends and comparisons.

Use of resources remains consistent within the pre- and posttest user groups. The personal library, organization library, knowledgeable person and federal publications were ranked highest in frequency of use for both groups. Percent of use is indicated in Table III.1.

Table III.1. Use of Information Services
(percent)

	Pretest N = 66	Posttest N = 50	Increase
Personal library	80	88	8
Organization library	83	90	7
University library	47	70	23
Special library	33	54	21
Transportation Center Library	55	88	33
Special organization	55	68	13
Knowledgeable person	82	96	14
Reference librarian	33	68	35
Automated information system	27	56	29
Federal publications	76	90	14

The responses ar based on pre- and posttest questionnaires with 43 intersecting returns. Despite the population difference, the analysis suggests that one possible effect of R-TRIS was to make the user more information-conscious: all sources of information received higher proportionate utilization based on total returns for each group or the subset of returns included in both groups.

More importantly, this table presents the number of information services accessed. The Chicago metropolitan area contains excellent library resources, including the Municipal Reference, the Chicago Public and the John Crerar libraries as well as many university and special libraries. Most of these libraries are

organized into a network which includes exchange of access privileges. The informed seeker is provided with both a channel and access route.

Use of the non-transportation libraries indicates the need for background materials required for transportation research and planning - demographic information, land use and economic forecasting are a few of the general areas in which the R-TRIS users sought information.

Links between organizations with similar objectives or responsibilities form an important information resource. For R-TRIS this seemed especially pertinent among the state and local government agencies responsible for urban transportation operations and planning. For intercity transportation one user acknowledged the importance of these links in his concern for an exchange of working papers among carriers; the release of internal studies would reduce duplicate effort and promote coordination.

The mode for estimated time spent in information activity was five percent for the posttest group, but the individual estimates ranged from one to fifty percent (excluding the librarians). Searches per month averaged 9.0 in 47 posttest returns (excluding the librarians). Four users conducted no searches, one estimated 75.

Information currency and relevancy concerned all users. However, some wanted older materials as well. The retrospective interest related primarily to engineering studies, but research on the introduction of new operations or techniques was not always related to currency.

Summarizing, there is little overall consistency among transportation information users which can be associated with function, experience or modal affiliation. Documents and person-to-person communications assume the highest priority for the majority of users. Directories, abstracting-indexing bulletins and library services are assigned a secondary level of use and evaluation, based on librarian's referral to these materials for or with the user.

The very great reliance on individual and organization contact is wholly consistent with the finding of studies on user information seeking in other scientific and technical disciplines. The advantages of this mode of access are outlined in the SATCOM report: timeliness, feedback, interpretation, transfer of supplementary or background information outside the scope of formal dissemination channels, and low investment in access time and costs.[1]

Federal Publications and Work in Progress

Use and evaluation of federal publications were addressed in the post-service questionnaire. Users estimated the contribution of federal documents to total information needs in a range of 5-75%, with 24 of the group designating

[1]National Academy of Sciences, Scientific and Technical Communications, a Pressing National Problem and Recommendations for Its Solution, a report by the Committee on Scientific and Technical Communications (Washington, 1969) p.92.

from 5-24%, 11 from 25-44%, 9 from 45-64% and 3 more than 64%. Forty-five users supplied estimates on frequency of use and satisfaction levels. Thirty-six of this group considered frequency of use weekly or monthly; 20 of 45 were completely or moderately satisfied.

The contribution of the federal government as a source of published information was compared with that of other sources (organizations and publications). The weighted average in the following table is the sum of the products (rank value x number of responses) divided by the total number of responses.

Table III.2. Information Sources

Source	Ranking 1	2	3	4	5	Weighted Average	Ranks 1-2 Total	Percent
Federal government	16	19	7	5	-	2.0	35	74.5
State/local government	4	13	14	6	10	3.1	17	36.2
Private industry	9	8	8	10	12	3.2	17	36.2
Universities	2	9	6	11	19	3.8	11	23.4
Associations	3	20	8	6	10	3.0	23	48.9
Journals	23	8	7	5	4	2.1	31	66.0

Federal publications and journals are considered the most important categories of information sources. Since trade association and academic journal coverage is at least partly based on federal sources (news releases, regulations, sponsored research) the contribution of federal publications is higher than indicated above.

Twenty-nine responses in 50 returns indicated satisfaction with current information on DOT work in progress. Nineteen users were dissatisfied. In this question the dissatisfied user was asked to describe the types of products necessary to meet his needs. All nineteen responded.

Eight of this group suggested more information on RFP's or work in progress, including monthly or bi-monthly bulletins incorporating project objectives. Four other users suggested a listing might be patterned after the DOT Publications Awareness Bulletin issued by R-TRIS Chicago. A daily newspaper (for federal and state government programs) and a publication similar to the NCHRP Research Results Digest were also mentioned.

Periodic progress reports on R&D were also desired, including other federal agencies (e.g., NASA) in addition to DOT. Three respondents wanted additional information on air transportation; one added FRA and OHSGT.

The post-service interview included a section on federal publications and work in progress. Comments concerned the age of publications (in some instances referring to delays in release by the contract sponsor), the need for operational research with results applicable to local government and carrier activity and the inadequate methodology or analysis used in some of the reports.

Concern about the age of publications points to the need for a DOT depository in regional center operation. A partial examination was made of the NTIS documents received on deposit at R-TRIS Chicago during the last several months of the project. The average lag between publication date and receipt date for 101 reports was 6.9 months. Since the NHTSA and TSC documents appeared to provide the fastest turnover, a separate count was taken for the reports issued by these agencies. The average lag was 4.3 months.

The lack of wide distribution for announcements of ongoing R&D projects and the need for information on criteria in selection and evaluation of projects were stressed in the post-service discussions. Again, the infeasibility of many of the projects for specific local applications was mentioned.

The consensus indicated a need-to-know more about DOT - activity, projects, programs, plans, legislation, regulations, criteria, evaluation, research, funding, reports - encompassing all operations of the Department. The users recognize much of this information is now available, in releases, in NTIS reports, in non-federal newsletters and journals, and in DOT work in progress announced through the research information services. However, it is not packaged and may not be disseminated throughout the transportation organization.

TRIS-On-Line

The conclusions on scope and currency in the abstracting/indexing services are limited to TRIS-On-Line rather than the total data base. The published abstracts of these services were widely known with the relevant series available in the organizations; the R-TRIS program did not offer batch searches provided by the Transportation Research Board.

The online data base was new to most users. One organization had subscribed prior to R-TRIS; one user came to R-TRIS for the publications cited in a batch search from HRIS. One librarian had not applied for subscription in that the air transportation component was still in a developmental stage.

To the majority of users, the TRIS-On-Line services created the most interest in the orientation sessions. In all meetings held at Northwestern an online demonstration was conducted for the user group.

The follow-up by the users provided a number of requests for the online services and one request for terminal instruction. The procedure stipulated in some requests was (1) computer printout, (2) user evaluation, and (3) user request for library search if required.

Seventy-one searches were requested by 36 users. Twenty-four made only one request; ten searches were conducted for one user.

In the posttest attitude scale, seven of 49 users agreed with a statement

that the searches of the TRIS-On-Line abstracting/indexing services added significant new information on their research. Eighteen thought the abstracts helpful while 14 considered the responses insufficiently up-to-date.

Twenty-nine respondents on the posttest indicated use and satisfaction levels. Nine were moderately satisfied, 11 neutral and 9 dissatisfied.

Comments on TRIS-On-Line in the returns referred to little or no use due to lack of success on the first attempt, subject gaps and irrelevancy, inadequate coverage of air transportation, unfamiliarity with the system and inaccessibility. On the last point two organizations responded that TRIS-On-Line would be a very convenient source if the terminal were available in-house; one is planning to subscribe. A third organization, with an in-house terminal, preferred accessing the online service through R-TRIS due to sporadic demand and requirements for personnel training.

Users were not consistent in the evaluation, indicating the varying range of interest in transportation, the functions performed and time pressure within the organizations. In the post-service interviews two users estimated overall relevancy at 33%. This ratio was very satisfactory to one; the other desired a 90% relevancy factor. The first represented a planning organization, the second an engineering group. In some cases the abstracts were highly rated; others considered title sufficient to identify relevant publications.

Referral Services

Northwestern University Faculty

Two requests for faculty services were processed for R-TRIS users. The first, a brief referral, concerned the identification of publications on a specialized traffic signalization technique and information about an announced publication yet to be released. The second, in the consultation category, required background information on the methodology of impact studies. In both cases the users were very satisfied with the results.

Several potential requests were established in the user/librarian contact, but in all of these cases the user wished to conduct the follow-up. The faculty contacts were not made.

Forty-two users responded to a question in the final survey forms on the reasons faculty services were not used more often or at all. Twenty-six indicated no need or no appropriate project during the period of the R-TRIS services. The other responses related non-use to the availability of other resources, the level of charges for faculty services, the complications of access (physical and procedural), lack of knowledge about the services or the opinion that faculty expertise was not sufficiently practical.

Users were also asked to estimate frequency of access and satisfaction with faculty services. In the following table the ratings for faculty and "knowledgeable persons" are compared, based on the responses in the posttest questionnaires. Some of the responses included experience prior to R-TRIS with Northwestern faculty on a consulting basis.

Table III.3. Faculty/Knowledgeable Person Use and Evaluation

Rating	Faculty				Knowledgeable Person			
	Daily	Weekly	Monthly	Yearly	Daily	Weekly	Monthly	Yearly
Satisfied	-	-	2	4	16	13	7	-
Neutral	-	-	-	9	2	3	1	2
Dissatisfied	-	-	1	1	1	2	1	-
Total	-	-	3	14	19	18	9	2

From the data the user is seen to be largely neutral about his accessibility to faculty, willing to advise his organization to subscribe to faculty services, but rating the faculty access on a completely different level, in terms of satisfaction and frequency, than his access to a "knowledgeable person".

Reasons for non-utilization of faculty services can be summarized: (1) the services seemed inappropriate to specific research projects, (2) access to the services was too complicated or unfamiliar to user research patterns.

The reasons for non-utilization imply a promotional problem. Discussion of faculty services at the initial orientation sessions and the description in the packet were insufficient to carry over to the service/user contacts. The R-TRIS project staff and advisory committee also recognized the problem and arranged a special mailing on faculty services. In addition, the librarians suggested faculty referral during discussions of specific requests for TRIS-On-Line and/or library searches. Neither effort brought additional or new interest.

Two procedures could have increased marketing effectiveness, but were not instituted in that the R-TRIS service was essentially demand responsive. The first is an automatically processed faculty referral on the first subject request from each user of R-TRIS Chicago, with the faculty participation highlighted in the return to the user. The second consists of faculty review and evaluation of the library or computer search results, again with indication to the user for follow-up with the faculty member.

The faculty service was rejected with very little use, although three-fourths of the users ranked a "knowledgeable person" as a primary information resource. The project marks the user's assessment of faculty referral as inappropriate in routine reference requests. Use of faculty in research consultancy (a service not offered through R-TRIS Chicago) is practiced by many of the R-TRIS user organizations; a referral to appropriate faculty may be sufficient in the services offered through a regional transportation research information service.

Transportation Systems Center Technology Sharing Program

In the orientation sessions with the R-TRIS user groups the Transportation Systems Center Technology Sharing Program was presented as an information center conducting specialized programs in areas of application to state and local government as well as a referral point for all transportation research and planning

interests in the user organizations. The referral service was also mentioned (selectively) in the librarian/user discussions on specific service requests. From these discussions two referrals were identified. The post-service interviews brought forth a third and additional requests by the initial users which *are not included in the R-TRIS records.*

To these users, the request for Technology Sharing Program service could be described as interaction with a "knowledgeable person." The contact with expert staff or referral to the appropriate expert was very effective. When the response consisted of a TRIS-On-Line or library bibliography acceptance was lower. In the user's mind the product and producer were mismatched.

The Transportation Systems Center, as the research arm of DOT, generated a great deal of interest. The possibilities for service to state and local governments were recognized. Again, to some, lack of first-hand knowledge was an impediment. In the post-service interviews several possibilities for interaction were discussed. Potential benefits to users could be most effectively realized through direct contacts with the Transportation Sharing Program Office.

Regional Center Capability

Types of reference service provided by the Transportation Center Library to R-TRIS Chicago users consisted of the preparation of bibliographies, selection of publications for review by the user (literature compilation), location of a desired fact or its source, identification of directory information, orientation to the card catalog and collection for onsite users, circulation and distribution of the current awareness services.

One hundred sixty-six requests for reference were received from 66 members of the group, averaging 2.5 per user of this service. The average per R-TRIS user was 1.5. The distribution on these requests follows that of the online service use: 34 users made one request; 12 users requested service five or more times, generating one-half of the total requests.

Topics of most of the searches were within the scope of the library collection. At times the Transportation Center Library holdings were supplemented by a search of other collections in Northwestern University Library, particularly the Technological Institute and Management libraries and the Government Publications collection. In nine cases no relevant information was found from the above and additional sources; for most of these the librarians suggested an alternate source or the user mentioned a second source he planned to contact.

Reference service accessible to a metropolitan area population proved useful. Two organizations were assigned carrels in the Transportation Center Library. Onsite use was preferred by a few users; the browsability of the card catalog and files of publications influenced this preference as well as the location of work or home close to the Northwestern University campus. At times the onsite use served to introduce the requestor to abstracting services other than TRIS-On-Line and additional general sources such as conference proceedings and yearbooks.

Citation requests, totaling 585, concerned the loan or photocopy of a spe-

cific publication or publication series for purchase or reference. During the period of this project 534 loans and photocopies were sent to R-TRIS users.

The majority of the requests were based on reference or computer searches or the current awareness bulletins distributed to all R-TRIS users. During the final months of the project the number of requests based on personal or work sources increased.

The requests for loans were usually filled from the Transportation Center Library collection, although the backup by other Northwestern University Library collections was essential for non-transportation materials.

Thirty-one (5.8%) of the requests could not be filled. In seven cases the publications were ordered or obtained from another library, six publications were in the Transportation Center Library but could not be located. Eleven users were referred to another source. In one case the item was too expensive for purchase; a second was an M.S. thesis, a category of publication not collected by the library.

Only 29 photocopies were ordered by the R-TRIS users at the effective rates for all Transportation Center Library users - $ .10 per page plus $ .50 handling charge per item. The low level of this activity can be ascribed to the fact that the user was always given the option to borrow hard copy at no charge or pay for photocopy. He usually borrowed.

The post-service response to frequency of use of personal, organization and Transportation Center Libraries is indicated in Table III.4. The user views his requirements for contacting the Transportation Center Library as monthly (64%) or yearly (25%), whereas personal and organizational libraries are checked daily or weekly by four-fifths and two-thirds of the users respectively.

Table III.4. Contacts with Libraries

Library	Daily	Weekly	Monthly	Yearly	Total
Personal library	24	11	7	2	44
Organization library	12	18	10	5	45
Transportation Center Library	-	5	28	11	44

From the library records the utilization beyond requests for loans seemed to concentrate on project searches, i.e., the preparation of a bibliography or assembly of publications at the beginning of a new study. Relatively few directory type questions were asked.

The current awareness bulletins provided a quick announcement service to the literature available at the Transportation Center Library, supplementing the retrospective capabilities in the abstracting/indexing service and the library card catalog. Overall, reception was excellent for each, judged by the number of requests for circulation and photocopies received and the distribution of issues beyond the designated groups within the user organizations.

Comments in the post-service interviews suggested that the DOT Publications Awareness Bulletin could serve as a prototype format for announcing DOT research in progress. TRANS-SCAN and the DOT Publications Awareness Bulletin might be improved through modal arrangement. These suggestions originated with the urban transportation users primarily; some preference for the intermodal approach was indicated by intercity transportation respondents.

As a current awareness service Current Literature in Traffic and Transportation was too tight typographically and contained too many entries according to at least one user. Another considered CLTT the most effective alerting service of the three publications.

Each publication met a different need, based on individual user responsibilities and inclination toward literature review. However, the subscription rejection rate on TRANS-SCAN was definitely higher than the rates for the other two publications. In addition, no significant change in transportation journal reading frequency occurred in a comparison of the pre- and posttest returns on the Transportation Journal Awareness Questionnaire.

Service Effectiveness

Service effectiveness is measured by utilization, user satisfaction, repeated queries and user-to-user referrals.

Based on the diary card returns and user estimates in the posttest questionnaires, 15-20% of all transportation information needs were presented to the regional center. The majority of these requests were submitted on the second or third step of a search, after checking in-house resources. Eighty-four percent of the users responding to the posttest questionnaires expressed satisfaction with the library services.

R-TRIS had no single-time users. The frequency of contacts by several of the group approached the utilization levels of an in-house resource according to the user comparison presented.

User-to-user referrals are indicated by the service requests from 59 non-designated users in the organizations and the internal circulation of the current awareness bulletins.

Users were also asked to rate the R-TRIS services in terms of willingness to advise their organizations to subscribe (Table III.5). Faculty consultancy services were rated very low, all other services received good ratings.

Post-service requests are also indicative of service effectiveness. Thirty reference requests were processed for R-TRIS users in the two month period following the completion of the project. Although most of these were brief reference (offered to the users at no charge) the total included one TRIS-On-Line search and two technical reference questions (the latter from the same organization). In addition a preliminary contact by a new organization was made at the referral of one of the user organizations.

The resources were not available within this project for a quantitative

Table III.5. Use and Rating of R-TRIS Services

Service	Price	N	Advise Subscription at Given Rate	Advise Subscription at Lower Rate	Advise Against Subscription
Faculty consultation (phone)	$15/request	35	15	13	7
Faculty Consultation (onsite extended)	$300/day	36	3	21	12
Circulation of items in Transportation Center Library	No charge	45	40	-	1
Brief reference assistance	No charge	44	37	1	1
Technical reference assistance	$25/hour	40	21	12	5
Verification of incomplete citations	No charge	32	25	-	6
Photocopies	$ .10/page + $ .50 handling	37	24	6	7
TRANS-SCAN subscription	$15/year	46	25	7	8
Current Literature in Traffic and Transportation subscription	$12/year	46	33	5	4
DOT Publications Awareness Bulletin	No charge	43	37	1	1
TRIS-On-Line search	$75/hour	38	13	13	10
Library organizational membership*	$350/year	37	20	11	5

*Includes unlimited circulation and interlibrary loans, 10 hours technical reference, 5 subscriptions to each current awareness bulletin.

analysis of the cost-benefits of the program. The analysis was approximated through discussions of cost-benefit in the post-service interviews. User comments were general concerning the benefits derived from the knowledge of new services, access to new information, referral of R-TRIS search results by the requesting organization to other organizations, reduction in information time and duplication of effort, the knowledge that no information was available.

The regional center program, as part of the TRISNET dissemination program, can improve access to transportation information by providing a defined and publicized location for the loan or photocopy of transportation publications, for searching the TRIS-On-Line data bases and for referral to other components of the network.

Service Feasibility

The feasibility of regional center operation is related to institutional constraints and the incremental costs associated with the services.

This discussion concerns the services offered by the Transportation Center Library in that the faculty services were not widely used and the online services were provided through the Library. The Transportation Center Library has offered loan and brief reference services extra-organizationally during the past fifteen years. Since 1969 extensive bibliographic services have been provided under a fee system, with the services available at the option of the Library staff. The significant change in the extra-organizational services during the R-TRIS program is that the user obtained the same priority treatment accorded the in-house user at no charge.

The question of institutional constraints has two aspects: the ability to offer services outside the organization under the policies established by the sponsor and the effect of external services on in-house users. In most operations the first factor, institutional policy, depends on the second, although proprietary considerations and awareness of external service costs, if present, will influence the policy.

At Northwestern, external services by the Transportation Center Library are subject to constraint in that the major services (reference and literature compilation) are offered on a cost-reimbursed basis. To date the sponsoring organizations, the Transportation Center and the Traffic Institute, have underwritten the costs of loan service based on the organizations' service commitments to the transportation community and the exchange under inter-library loan.

The second factor, effect of external services on in-house users, was not judged to be critical during the operation of the regional center. Queuing for publications within the R-TRIS group or the total transportation library group was minimal. Where it did occur photocopies could be substituted at times; the users cooperated with short loans and early returns.

An attempt was made to identify costs associated with the services to the R-TRIS group. Excluding project planning, terminal and depository costs, the amount was $24,310. Of this total development costs are estimated at $7,740. The breakdown follows:

	Total Costs	Development Costs
Personnel Librarian (.60 FTE) Secretary (.50 FTE) Records and Supervision (.05 FTE)	$11,000	$4,360
TRIS-On-Line searches	2,900	
Mail and publications	1,500	
Telephone	300	
Typewriter	85	
Overhead and benefits	8,525	3,380
Total	$24,310	$7,740

The organizations were charged $4,850 for this service against their hypothetical funding allocations, in accordance with the fee schedule distributed at the introduction of the services. The charges are listed in Table III.5. as presented in the posttest questionnaire. This schedule differs from the fees in effect during the project in that R-TRIS charged for loans ($1), citation verification ($2) and brief reference assistance ($2).

A comparison of the hypothetical income and actual costs would lead to a conclusion that the services were underpriced. To some extent this may be true; the cost of a publication mailed to the user is close to $2 based on staff time and first class postage rates. This charge excludes the cost of processing the interlibrary loan form.

Publication costs and staff orientation represent development costs in part, which would not be a factor in routine activity. Some of the costs are based on necessary service support - the need to search a report in processing or obtain counsel from a second reference librarian to respond to a request. This time was not charged the user.

Nevertheless, actual costs exceeded hypothetical income. This, combined with the data on user information patterns and service requirements, suggests a regional center commitment at a lesser scale than that undertaken by R-TRIS Chicago. The recommended configuration is presented in the following section.

IV. CONCLUSIONS AND RECOMMENDATIONS

The R-TRIS users, representing various transportation functions and activity, present a range of information requirements in subject scope, currency, spatial levels and delivery. Although the majority were associated with the urban transportation field and planning/research functions the diversity in subject requests projects an information need in operations, planning, regulation and technology for all levels of transportation activity by the user and carrier.

No significant relationship became evident between information requirements and modal affiliation, position, function, experience or education. Common to all users, however, were the high priority ratings on use of and satisfaction with personal files and the knowledgeable person. Utilization of a number of resources, whether categorized by type of publication or type of information center, was also characteristic of the majority.

The conclusions and recommendations for the regional center component of TRISNET are based on the record and analysis of user/service interaction and regional center feasibility.

Use and Evaluation of Federal Publications and Work in Progress

Federal publications and work in progress were critically important to all users. Although use levels were established at 90% and the contribution of federal publications at the state and local operations level outweighed local government sources, private industry, associations, universities and journals, only 40-60% of the users were satisfied. Users experienced a need for greater timeliness and more specific application.

Three recommendations on the dissemination and utilization of federal publications and research in progress are made.

A DOT Status Report, to consolidate highlights of DOT activity, programs and research in the various agencies of the Department, could be issued monthly or bi-monthly. Distribution in multiple copies to all transportation organizations, public and private, should improve the user's awareness of DOT activities. The identification of a DOT contact on new programs is necessary for follow-up information in a specific area.

A TRIS-On-Line legislative announcement service was desirable, according to one user, to indicate the status of congressional action on transportation legislation, accompanied by resumes on the contents of bills, reports issued and relationship to concurrent and previous bills or public laws. The online file should be searchable by subject, DOT or other federal agency involved, hearing witness and congressional committee.

DOT depository of reports distributed through NTIS should be furnished to each regional center, to enlarge the center's collection of these publications to TRISNET coverage, to supply any duplicate copies necessary for external service demands and to assure early availability of the publications.

DOT Publications Awareness Bulletin distributed by R-TRIS Chicago was well received; it provided a quick survey of current reports issued by the National Technical Information Service and the association of availability with the regional center. The bulletin could easily be expanded to include TRIS-On-Line news, new TRISNET products, and service changes or expansion affecting the user. The combination of information about transportation information with information about transportation research may be an effective alerting device.

This report opened with a definition of one-stop service, wherein the transportation information seeker can access a complex of transportation resources by contacting any single point in the National Network of Transportation Research Information Services. The investigation of regional centers indicates the concept is valid, although the requirements for non-transportation data and the necessary flexibility to allow the user to choose his path through the system must be recognized. One-stop service, in many instances first-stop service, can be provided by the center through the TRIS-On-Line and referral capability and access to the document store.